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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,346	07/17/2003	Hiroshi Sumi	Q76616	8680
65565 7590 03/05/2007 SUGHRUE-265550 2100 PENNSYLVANIA AVE. NW WASHINGTON, DC 20037-3213			EXAMINER LAM, CATHY FONG FONG	
			ART UNIT	PAPER NUMBER
			1775	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/620,346

Applicant(s)

SUMI ET AL.

Examiner

Cathy Lam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10 and 15 is/are pending in the application.
- 4a) Of the above claim(s) 15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

In view of the amendment and remarks filed on November 22, 2006, the pending claims continue to be unpatentable as following:

Election/Restrictions

1. Newly submitted claim 15 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 15 involves with a method for producing a wiring board which belongs to another class.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 15 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

If in the event that the product claims become allowable, the process claims will be rejoined providing the process claims are commensurate in scope with the product.

Claim Rejections - 35 USC § 112

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase “non-vitrifiable after sintering selected from the group consisting.....” is vague and indefinite, as it is unclear what is *non-vitrifiable* after sintering and what are the inorganic materials (i.e. Al₂O₃, TiO₂, CeO₂ and mullite) in relationship with the copper paste? Clarification is required.

Claim Rejections - 35 USC § 102/103

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4, 6-10 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kang et al (US 5296189).

Kang discloses a conductive composition comprised of copper particles and alumina particles. The conductive composition is formed into a conductive paste which is screen-printed onto a ceramic substrate to form a printed circuit board. The conductive paste may be filled into via holes of the ceramic substrate or printed onto the surface of the ceramic substrate (col 6 L 40-43 & L 54-56).

The conductive composition that comprised of copper particles having initial particles size of 2 to 5 μm and the alumina particles of 0.05 to 0.1 μm (or 50-100 nm) in average (col 5 L 43-45 & L 68-col 6 L 1). Kang further teaches that other inorganic materials such as titania (or TiO_2) and silica (or SiO_2) are feasible and have the same function as alumina particles (col 4 L 34-35). The amount of alumina particles is 0.5 to 2 wt% (col 4 L 40-41).

The conductive composition further comprises of an organic vehicle and/or binder (col 9 L 39-40).

The prior art is silent about the resistivity of the conductive layer, the examiner is taking the position that since Kang's conductive paste meets the claimed composition, inherently Kang's copper paste possesses the same resistivity.

The examiner is taking the position that Kang teaches claims 6, 8-9, since average size of the alumina particles is $0.05\text{ }\mu\text{m}$, i.e. $< 2\text{ }\mu\text{m}$. Kang further teaches that such small size alumina particles is for a more homogeneous mixture with the copper power and to reduce interparticle porosities (col 6 L 1-12). This implies that the inorganic particles are evenly dispersed with the copper particles and formed a homogeneous conductive layer (col 4 L 57-61).

Regarding to claim 7, Kang teaches a multilayer printed circuit board, and the conductive paste that is formed in the via holes and between the ceramic substrates, the examiner is taking the position that the conductive paste is subjected to a plating treatment (col 6 L 51-56).

Kang teaches the present invention but does not specifically teach having both SiO_2 and ceramic particles, however in view of column 4 lines 30-35, it would have been obvious that there can be other sintering retardants because TiO_2 and SiO_2 are well known inorganic sintering retardants.

Claim Rejections - 35 USC § 103

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al (US 5296189).

Kang discloses the ceramic substrate that is formed of crystallizable glass particles that are densified to from a green sheet (col 7 L 8-13).

The crystallizable glass particles can include lithium disilicate and/or eucryptite, both of which containing lithium and in the form of an alkali metal oxide (col 9 L 3-20).

Kang is silent about the mol% of the alkali metal oxide in the green sheet. In view of Kang's teaching, one skill in the art would choose a workable amount because it only involves routine experimentation.

Response to Arguments

6. Applicant's arguments filed on November 22, 2006 have been fully considered but they are not persuasive. The examiner continues to rely on the teaching of Kang.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mohri et al (US 5922245) teaches a conductor paste comprised of metal powder, swelling agent, adhesion improver and an organic vehicle (col 2 L 50- col 3 L 20). All the ingredients are within Applicant's present invention.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538.

The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Cathy Lam
Primary Examiner
Art Unit 1775

cfl

February 28, 2007